AMENDMENTS TO CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A noise reduction method for dividing input noise speech into a plurality of continuous frames, determining a noisy speech spectrum for each frame, and partitioning a frequency band into multiple sub-bands to determine a clean speech spectrum from the noisy speech spectrum on each sub-band, the method comprising:

(A) estimating a noise spectrum $|W_r(k)|^2$ of an r-th frame at a k-th frequency component from the noisy speech $y_r(k)$ of the r-th frame by silence detection and noise spectrum estimation;

(B) estimating a signal-to-noise ratio (SNR) value $SNR_r(i)$ of an i-th sub-band for the r-th frame by applying a regression process to the SNR of the i-th sub-band for the (r-1)-th frame after noise reduction, the noisy speech spectrum, and the noise spectrum of the i-th sub-band for the r-th frame;

(C) determining an over-subtraction factor $\alpha_r(i)$ of sub-band i based on the estimated $SNR_r(i)$; and

(D) determining a clean speech spectrum estimate by performing, on each sub-band, a spectral subtraction $|\hat{S}_r(i,k)|^2 = |Y_r(i,k)|^2 - \alpha_r(i) \cdot |W_r(i,k)|^2$,

wherein $Y_r(i,k)|^2$ is the noisy speech spectrum of the r-th frame at the ~~k-the~~ k-th frequency component of the i-th sub-band, $|W_r(i,k)|^2$ is the corresponding noise spectrum[[,]] and $|\hat{S}_r(i,k)|^2$ is the clean speech spectrum at sub-band i for the r-th frame.

2. (Currently Amended) The noise reduction method as claimed in claim 1, wherein in step (C), the over-subtraction factor of the i-th sub-band for the r-th frame is:

$$\alpha_r(i) = \alpha_0(i) + SNR_r(i) \cdot \frac{1 - \alpha_0(i)}{SNR_1(i)},$$

where $\alpha_0(i)$ is a pre-selected over-subtraction factor when the actual $SNR_r(i) = 0$ at sub-band i, $SNR_1(i)$ represents a pre-selected SNR value when $\alpha_r(i) = 1$[[,]] ~~and $SNR_r(i)$ is an SNR estimate of the i-th sub-band for the r-th frame~~.

3. (Original) The noise reduction method as claimed in claim 2, wherein, the over-subtraction factor $\alpha_r(i)$ of the sub-band is modified by the SNR value SNR_r of the frame as:

$\alpha_r(i) = \alpha_{max}$ if $SNR_r < SNR_{min}$,

where SNR_{min} is a pre-selected minimum value of SNR.

4. (Currently Amended) The noise reduction method as claimed in claim ~~2~~ 1, wherein $SNR_r(i)$ is obtained by a regression process:

$$SNR_r(i) = \mu \cdot SNR_{r-1}^{o}(i) + (1-\mu) \cdot 10 \cdot \log_{10}\left(\frac{\sum_{k \in sub-band\ i} |Y_r(i,k)|^2}{\sum_{k \in sub-band\ i} |W_r(i,k)|^2} - 1 \right)$$

where μ is a predetermined weight in a range of $0 < \mu < 1$, and $SNR_{r-1}^{o}(i)$ is the SNR of the sub-band i for the previous frame after noise reduction.

5. (Currently Amended) The noise reduction method as claimed in claim ~~1~~ 4, wherein $SNR_{r-1}^{o}(i)$ is determined by:

$$SNR_{r-1}^{o}(i) = 10 \cdot \log_{10} \frac{\sum_{k \in sub-band\ i} |\hat{S}_r(i,k)|^2}{\sum_{k \in sub-band\ i} |W_r(i,k)|^2} .$$

6-9. (Canceled)